Original Article

Mini-cholecystectomy Under Local Anaesthesia

Somard Tangjaroen and Prasit Watanapa,[1] Department of Surgery, Kalasin Hospital, Kalasin, and [1]Department of Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand.

OBJECTIVE: Reports of mini-cholecystectomy (MC) under general anaesthesia in the surgical treatment of gallbladder disease are common, but those of MC under local anaesthesia are much more limited. We report our experience of MC under local anaesthesia.

METHODS: Forty-two patients with gallstone disease scheduled for MC under local anaesthesia were included in this study. Twenty-seven were female, with a median age of 54.5 years (range, 29–71) and median body mass index (BMI) of 20.5 (range, 17.6–23.4). None of the patients had evidence of acute cholecystitis on admission or previous upper abdominal surgery. MC was performed by a standardized technique and under the combination of local anaesthesia (1% xylocaine with adrenaline) and intravenous administrations of fentanyl (0.001–0.002 mg/kg) and midazolam (0.05–0.1 mg/kg).

RESULTS: The median operative time was 40 minutes (range, 35–64). Local anaesthesia was converted to general anaesthesia in two patients owing to the discomfort caused by lysis of dense adhesions around the gallbladder, giving a success rate of 95%. MC was done successfully in all patients without any postoperative complications. The median hospital stay was 5 days (range, 2–7).

CONCLUSION: MC under local anaesthesia is an effective surgical procedure for patients with BMI of less than 24, who have no evidence of acute inflammation of the gallbladder and no previous upper abdominal surgery. [*Asian J Surg* 2007;30(4):235–8]

Key Words: gallstones, local anaesthesia, mini-cholecystectomy

Introduction

Mini-cholecystectomy (MC) was first described more than two decades ago by Dubois and Berthelot,[1] and their favourable results were reported at the same time laparoscopic cholecystectomy (LC) was introduced into the UK in 1990.[2–4] Subsequently, four randomized clinical trials have compared LC and MC in the elective treatment of gallbladder stones.[5–8] More recently, MC has been shown to be an effective surgical procedure for an inflamed gallbladder regardless of the degree and type of inflammation.[9]

Both MC and LC are usually performed under general anaesthesia. However, it is likely that in suitable patients or in those who are unwilling to have general anaesthesia or have severe contraindications to narcosis, the gallbladder can be excised under local anaesthesia through a very small incision. The aims of this study were to report our experience of MC under local anaesthesia and to propose our criteria for case selection.

Patients and methods

Forty-two patients with gallstone disease who were scheduled for MC under local anaesthesia between March 2002 and October 2004 were included in this study. There were 27 women, and the median age was 54.5 years (range, 29–71). The median body mass index (BMI) was 20.5 (range, 17.6–23.4). Two patients had underlying pulmonary

Address correspondence and reprint requests to Dr Prasit Watanapa, Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.
E-mail: sipwt@mahidol.ac.th • Date of acceptance: 2 February 2007

problems that rendered them relatively inappropriate for general anaesthesia, namely pulmonary tuberculosis and chronic obstructive pulmonary disease. Patients were scheduled for MC under local anaesthesia if they fulfilled the following criteria: (1) BMI of less than 24; (2) no history of previous upper abdominal surgery; (3) no evidence of acute inflammation of the gallbladder on admission; and (4) gave written informed consent.

Operation

All procedures were performed by a single surgeon (ST) according to the technique previously described.[9] Anaesthetic management involved the combination of intravenous administrations of fentanyl (0.001–0.002 mg/kg) and midazolam (0.05–0.1 mg/kg) and local anaesthesia in the area of skin incision by means of infiltration and injection of 1% xylocaine with adrenaline (20–30 mL) to include skin, subcutaneous tissue and rectus abdominis muscle. The incision was started approximately 3 cm to the right of the midline and ran obliquely parallel to and 3 cm below the right costal margin. The length of the incision was either 4 or 5 cm, mostly depending on the size of the patient. The rectus muscle was cut with diathermy. After entering the abdominal cavity, 1–2 mL of 1% xylocaine with adrenaline was injected into the tissue in the area of Callot's triangle in order to prevent any discomfort caused by traction of the gallbladder (Figure 1). All patients had retrograde or "cystic duct-first" cholecystectomy, and the stumps of the cystic duct and cystic artery were ligated with non-absorbable suture material (instrument-assisted ligation). The term "operative time" was defined as the period starting at "knife to skin" and finishing at "last stitch".

Results

MC was performed successfully in all patients without the need to extend the incision. However, general anaesthesia was applied in two patients because of the discomfort caused by lysis of dense adhesions around the gallbladder, hence the success rate of MC under local anaesthesia was 95%. The median operative time was 40 minutes (range, 35–64), and median hospital stay was 5 days (range, 2–7). An oral diet was started within 24 hours of operation in all but the two patients with general anaesthesia. Patients were routinely given intravenous morphine after surgery and, on average, each patient was given 1.6 doses of intravenous morphine. There was neither operative mortality nor surgery-related complications.

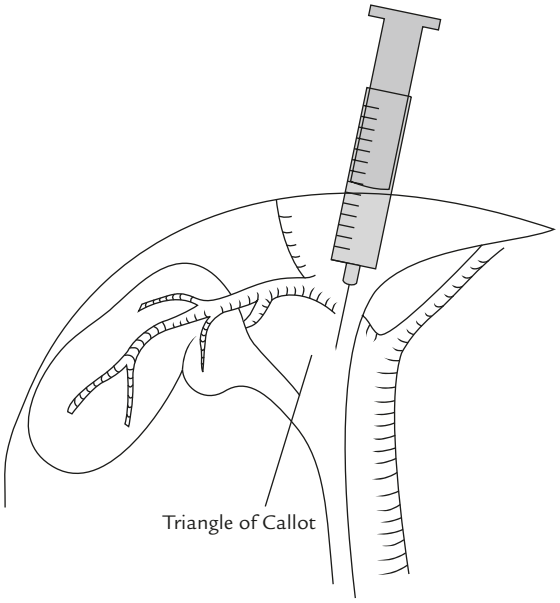

Figure 1. One to 2 mL of 1% xylocaine with adrenaline was injected into the tissue in the area of Callot's triangle.

Discussion

More than 2,000 cases of MC have been reported worldwide without any deaths or major common bile duct injuries since the first report in 1982.[1–3,5,7–10] Although three randomized controlled trials showed better results for LC than MC with gallbladders that were not acutely inflamed, in terms of shorter hospital stay, reduced postoperative analgesic requirements or earlier return to normal activities,[5–7] a more recent study from Majeed and colleagues showed that LC took longer to perform than MC and did not have significantly better recovery.[8] It is therefore reasonable to conclude that the two procedures have been accepted as effective minimally invasive surgical procedures for nonacute gallbladder disease. However, none of these reports involved surgery under local anaesthesia. Considering that LC has to be done under general anaesthesia, MC might be beneficial to patients who are unwilling to have general anaesthesia or who have a contraindication to narcosis (e.g. chronic obstructive pulmonary disease) if it can be done effectively under local anaesthesia as shown in our series.

The report of our earlier experience showed that MC under local anaesthesia could be done safely in patients with BMI of less than 21 with a success rate of

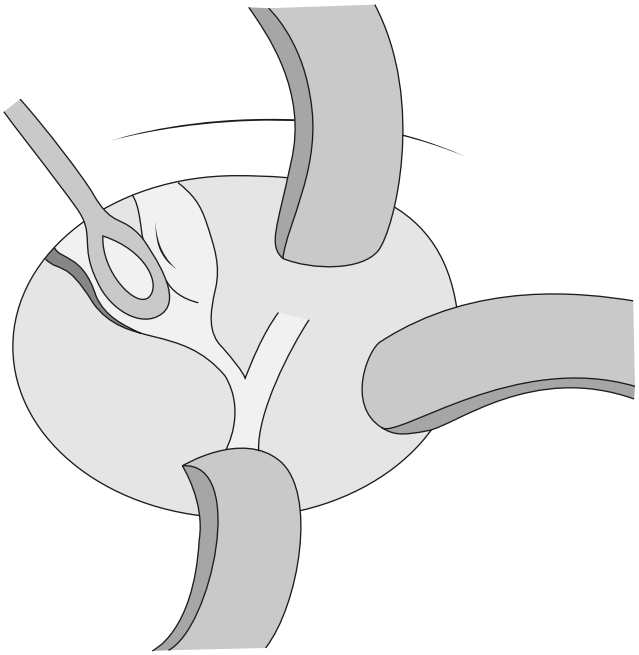

Figure 2. Three small Dever retractors of 2.5 × 3.0 cm were used to adequately expose the surgical field.

87%.[11] With more experience, we firstly established the technique and then identified suitable patients. Subsequently, we have now extended the procedure to cover patients with BMI higher than 21 but have limited ourselves to the level of 24 and in patients with nonacute gallbladder disease.

Although a transverse incision in the right upper quadrant is the most popular approach for MC[5,8,12,13] and is less painful than a vertical incision,[14] we prefer to use a small oblique incision. According to our protocol, intravenous morphine was routinely given to patients after cholecystectomy. The average doses of morphine for patients who underwent MC under local anaesthesia, standard conventional open cholecystectomy and LC were 1.6, 3.4 and 1.2, respectively. It should be noted that cutting of the rectus abdominis muscle by diathermy via oblique incision can be done more effectively than through a transverse incision where the patient is not given a muscle relaxant, resulting in better exposure. Special retractors, such as the Harrington-Pemberton or Bookwalter retractor, are recommended by some surgeons,[13,15] but we find retraction by the simple instruments (three small Dever retractor of 2.5 × 3.0 cm) to be completely satisfactory (Figure 2). Therefore, the expense of MC under local anaesthesia was only one-third of that of LC (3,317 Thai baht *vs.* 10,883 Thai baht).

The median operative time of 40 minutes for MC in the present study was in accordance with that in previous reports of 40–74 minutes,[5–8,12,16] but postoperative stay was slightly longer. It should be pointed out that patients who reside in rural areas of Thailand prefer to remain in hospital until they feel that their symptoms, particularly those of pain, have disappeared or much improved. For example, the average length of stay of patients who underwent LC during the same period was 2.6 days. Therefore, the length of stay in this series did not truly reflect the necessity for hospitalization.

The following conclusions can be drawn from the data from this study: (1) MC can be performed effectively under local anaesthesia provided the criteria have been fulfilled (i.e. BMI < 24, no history of previous upper abdominal surgery, no evidence of acute inflammation of gallbladder on admission); (2) a 4–5 cm right subcostal incision is the appropriate choice for MC under local anaesthesia; (3) MC can be done without the use of special instruments.

References

1. Dubois F, Berthelot B. Cholecystectomie par mini-laparotomie. *Nouv Presse Med* 1982;11:1139–41.
2. O'Dwyer PJ, Murphy JJ, O'Higgins NJ. Cholecystectomy through a 5 cm subcostal incision. *Br J Surg* 1990;77:1189–90.
3. Ledet WP Jr. Ambulatory cholecystectomy without disability. *Arch Surg* 1990;125:1434–5.
4. Nathanson LK, Shimi S, Cuschieri A. Laparoscopic cholecystectomy; the Dundee technique. *Br J Surg* 1991;78:155–9.
5. Barkun JS, Barkun AN, Sampalis JS, et al. Randomised controlled trial of laparoscopic versus minicholecystectomy. *Lancet* 1992;340:1116–9.
6. McMahon AJ, Russell IT, Baxter JN, et al. Laparoscopic versus minilaparotomy cholecystectomy: a randomised trial. *Lancet* 1994;343:135–8.
7. McGinn FP, Miles AJG, Uglow M, et al. Randomised trial of laparoscopic cholecystectomy and minicholecystectomy. *Br J Surg* 1995;82:1374–7.
8. Majeed AW, Troy G, Nicholl JP, et al. Randomised, prospective, single-blind comparison of laparoscopic versus small-incision cholecystectomy. *Lancet* 1996;347:989–94.
9. Watanapa P. Mini-cholecystectomy: a personal series in acute and chronic cholecystitis. *HPB* 2003;5:231–4.
10. Oyogoa SO, Komenaka IK, Ilkhani R, Wise L. Mini-laparotomy cholecystectomy in the era of laparoscopic cholecystectomy: a community-based hospital perspective. *Am Surg* 2003;69:604–7.

11. Tangjaroen S. Minilaparotomy cholecystectomy under local anaesthesia. *Siriraj Hosp Gaz* 1996;48:617–9.
12. Schmitz R, Rohde V, Treckmann J, Shah S. Randomised clinical trial of conventional cholecystectomy versus minicholecystectomy. *Br J Surg* 1997;84:1683–6.
13. Seale AK, Ledet WP Jr. Minicholecystectomy. A safe, cost-effective day surgery procedure. *Arch Surg* 1999;134:308–10.
14. Armstrong PJ, Burgess RW. Choice of incision and pain following gallbladder surgery. *Br J Surg* 1990;77:746–8.
15. Russell RCG, Shankar S. The stabilized ring retractor: a technique for cholecystectomy. *Br J Surg* 1987;74:826.
16. Assalia A, Kopelman D, Hashmonai M. Emergency minilaparotomy cholecystectomy for acute cholecystitis: prospective randomized trial—implications for the laparoscopic era. *World J Surg* 1997;21:534–9.